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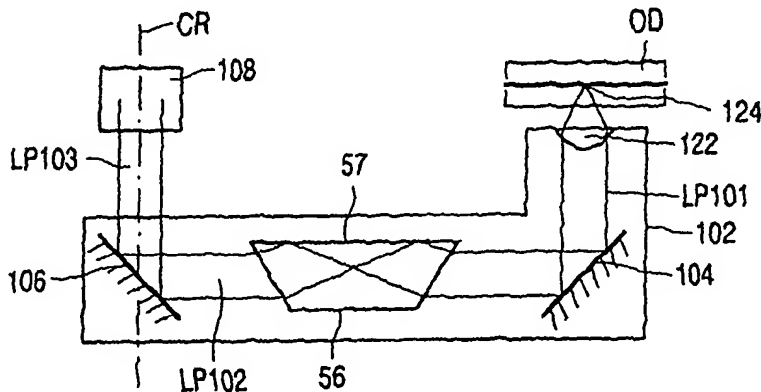
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(54) Title: OPTICAL SCANNING DEVICE



(57) Abstract: An optical  
scanning device for scanning an  
information layer of an optical  
record carrier and including a  
rotary arm (2; 102; 202; 302;  
402; 502) which is arranged to  
swing about a rotation axis (CR)  
to alter an angular position of  
the rotary arm about the rotation  
axis; a detector arrangement (10)  
arranged separate from the rotary  
arm (2; 102; 202; 302; 402; 502)  
for detecting a radiation beam  
spot, the radiation beam spot (40;  
140; 240; 340; 440; 540) having  
an angular disposition; a first  
reflective surface (4; 104; 204; 304;

404; 504) attached to the rotary arm (2; 102; 202; 302; 402; 502); a second reflective surface (6; 106; 206; 306; 406; 506) attached to the rotary arm (2; 102; 302; 402; 502); a first light path (LP 1; LP 101; LP201; LP301; LP401; LP501) running from a location on the record carrier to said first reflective surface; a second light path (LP2; LP102; LP202; LP302; LP402; LP502) running from said first reflective surface to said second reflective surface; a third light path (LP3; LP103; LP203; LP303; LP403; LP503) running from said second reflective surface to said detector arrangement (10). The rotary arm includes at least one optical inversion element (52; 54; 56; 58; 64; 66) arranged such that a dependence between variation of the angular disposition of the radiation beam spot and variation of the angular position of the rotary arm is reduced.

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According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

WPI Data, PAJ, EPO-Internal, IBM-TDB

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	PATENT ABSTRACTS OF JAPAN vol. 1999, no. 04, 30 April 1999 (1999-04-30) & JP 11 016195 A (TOSHIBA CORP), 22 January 1999 (1999-01-22) abstract	1-11
A	US 2001/007547 A1 (NISHIKAWA HIROSHI ET AL) 12 July 2001 (2001-07-12) the whole document	1-11
A	US 6 215 755 B1 (KWIATKOWSKI STEPHEN L ET AL) 10 April 2001 (2001-04-10) the whole document	1
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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A	PATENT ABSTRACTS OF JAPAN vol. 014, no. 477 (P-1118), 17 October 1990 (1990-10-17) & JP 02 192043 A (FUJITSU LTD), 27 July 1990 (1990-07-27) abstract	1-11
A	<div style="text-align: center;">---</div> PATENT ABSTRACTS OF JAPAN vol. 2002, no. 04, 4 August 2002 (2002-08-04) & JP 2001 357549 A (FUJITSU LTD), 26 December 2001 (2001-12-26) cited in the application abstract <div style="text-align: center;">-----</div>	1-11

# INTERNATIONAL SEARCH REPORT

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 11016195	A	22-01-1999	NONE
US 2001007547	A1	12-07-2001	JP 11134680 A 21-05-1999
			JP 11134683 A 21-05-1999
			JP 11134684 A 21-05-1999
US 6215755	B1	10-04-2001	NONE
JP 02192043	A	27-07-1990	JP 2870775 B2 17-03-1999
JP 2001357549	A	26-12-2001	NONE